

## WHAT IS CLAIMED IS:

### 1. Excavating apparatus comprising:

5 a support structure having a projecting portion onto which a wear member may be placed to shield said projecting portion from wear, said projecting portion having an exterior side surface through which a connector opening inwardly extends; and

10 a connector structure carried by said projecting portion of said support structure and operative to releasably retain the wear member on said projection portion, said connector structure including:

a hollow body extending along an axis and being axially and nonrotatably received in said connector opening, said hollow body having an outer end through which a pin opening axially extends,

15 a connector pin member having a cylindrical body portion coaxially received in said pin opening, and an outer end portion projecting outwardly beyond said outer end of said hollow body and said exterior side surface of said projecting portion of said support structure, said outer end of said connector pin member having, with respect to said cylindrical body portion, a laterally reduced cross-section, and

20 first cooperating structures associated with said hollow body and said connector pin member and functioning to permit rotation of said connector pin member relative to said hollow body about said axis, but preclude appreciable axial movement of said connector pin member relative to said hollow body.

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### 2. The excavating apparatus of Claim 1 wherein:

said support structure is an adapter, and said projecting portion is a nose portion of said adapter.

3. The excavating apparatus of Claim 2 wherein:  
said nose portion has an elliptical cross-section.

4. The excavating apparatus of Claim 1 wherein:

5        said hollow body and said connector opening have noncircular cross-sections along their axial lengths.

5. The excavating apparatus of Claim 4 wherein:

10       said hollow body has a generally cylindrical configuration with a lateral lobe extending along a side portion thereof.

6. The excavating apparatus of Claim 1 wherein:

15       said outer end portion of said connector pin member is laterally offset from said axis of said cylindrical body portion of said connector pin member.

7. The excavating apparatus of Claim 4 wherein:

20       said outer end portion of said connector pin member has a first side portion defining an axially outward extension of the outer side surface of said cylindrical body portion of said connector pin member, and a second side portion extending generally chordwise relative to said cylindrical body portion of said connector pin member.

8. The excavating apparatus of Claim 7 wherein:

25       said connector pin member has an axially facing end surface disposed at the inner termination of said outer end portion of said connector pin member and having a drive opening extending axially inwardly therethrough.

9. The excavating apparatus of Claim 1 wherein:

said outer end portion of said connector pin member is defined by a diametrically extending tab projecting longitudinally outwardly from said cylindrical body portion of said connector pin member.

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10. The excavating apparatus of Claim 9 wherein:

said tab has a tapered configuration.

11. The excavating apparatus of Claim 1 wherein:

10      said outer end portion of said connector pin member has a notch extending generally diametrically therethrough between opposite side surface portions thereof.

12. The excavating apparatus of Claim 1 wherein said first  
15 cooperating structures include:

a circumferentially extending groove formed in an exterior side surface portion of said cylindrical body portion of said connector pin member, and a laterally inwardly projecting member carried by said hollow body and received in said groove.

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13. The excavating apparatus of Claim 12 wherein:

said laterally inwardly projecting member is a set screw.

14. The excavating apparatus of Claim 12 wherein:

25      said laterally inwardly projecting member is a dowel.

15. The excavating apparatus of Claim 1 further comprising:

second cooperating structures associated with said hollow body and said connector pin member and functioning to releasably hold said connector pin member in first and second separate rotational orientations thereof relative to said hollow body member.

16. The excavating apparatus of Claim 15 wherein said second cooperating structures include:

first and second spaced apart recesses formed in one of said hollow body member and said connector pin member, and

a resiliently depressible detent structure carried by the other of said hollow body and said connector pin member and being releasably receivable in a selectively variable one of said first and second spaced apart recesses.

17. The excavating apparatus of Claim 16 wherein:  
said first and second spaced apart recesses have ramped configurations.

18. The excavating apparatus of Claim 16 wherein:  
said first and second spaced apart recesses are formed in interior side surface portions of said hollow body which are axially spaced apart from one another and generally circumferentially aligned with one another, and

said resiliently depressible detent structure is carried by said cylindrical body portion and includes first and second resiliently depressible detent members axially and circumferentially spaced apart from one another.

19. The excavating apparatus of Claim 15 wherein said second cooperating structures include:

a circumferentially extending groove formed in an exterior side surface portion of said cylindrical body portion of said connector pin member and having opposite end depressions, and

a detent member transversely carried by said hollow body and having a resiliently depressible inner end portion extending into said groove and adapted to slide along said groove as said pin member is rotated relative to said hollow body and snap into either of said end recesses when reaching the groove end associated therewith.

20. The excavating apparatus of Claim 19 wherein:

said detent member is a spring plunger transversely threaded into said hollow body.

21. The excavating apparatus of Claim 15 wherein said second cooperating structures include:

a circumferentially extending groove formed in an exterior side surface portion of said cylindrical body portion of said connector pin member and having opposite end portions extending in a first direction parallel to the length of said connector pin member,

a detent member carried by said hollow body for movement relative thereto parallel to the length of said connector pin member between first and second limit positions, said detent member having a portion thereof slidably received in said groove, and

a spring member resiliently biasing said detent member in said first direction toward one of said first and second limit positions.

22. The excavating apparatus of Claim 21 wherein said second cooperating structures further include:

a longitudinal opening formed in said hollow body laterally outwardly of said connector pin member, and

5 a locking rod member slidably received in said longitudinal bore and having an outer end portion projecting outwardly from an end of said hollow body, said locking rod member being outwardly biased by said spring structure and having a transverse opening through which said detent member extends, said detent member being movable with said  
10 locking rod member in said first direction relative to said hollow body.

23. The excavating apparatus of Claim 15 wherein said second cooperating structures include:

a detent member carried by said connector pin member and having  
15 a resiliently depressible end portion projecting outwardly beyond an exterior side surface of said connector pin, and

first and second circumferentially spaced apart depressions formed the interior side surface of said hollow body, and into which said detent member end portion may resiliently snap into as said connector pin  
20 member is rotated relative to said hollow body.

24. The excavating apparatus of Claim 23 wherein:

said detent member is a spring plunger transversely threaded into said connector pin member.

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25. Excavating apparatus comprising:

a support structure having a projecting portion extending lengthwise in a forward direction and having an exterior surface portion through which a connector opening inwardly extends in a direction  
5 generally transverse to said forward direction;

a wear member having a cavity forwardly and releasably receiving said projecting portion of said support structure and having a rear end disposed rearwardly of said connector opening; and

a connector pin longitudinally extending into said connector  
10 opening and having a longitudinal portion extending outwardly beyond said exterior surface portion of said projecting portion of said support structure,

said connector pin being supported for rotation relative to said projecting portion of said support structure, without appreciable axial  
15 movement relative thereto, between (1) a first rotational position in which said outwardly extending longitudinal portion of said connector pin blocks forward removal of said wear member from said projecting portion of said support structure, and (2) a second rotational position in which said  
20 outwardly extending longitudinal portion of said connector pin no longer blocks, and thus permits, forward removal of said wear member from said projecting portion of said support structure.

26. The excavating apparatus of Claim 25 wherein:

said support structure is an adapter,

25 said projecting portion of said support structure is a nose portion of said adapter, and

said wear member is a replaceable tooth point.

27. The excavating apparatus of Claim 25 further comprising:  
a detent structure operative to releasably hold said connector pin in either selected one of said first and second rotational positions thereof.

5        28. The excavating apparatus of Claim 25 wherein:  
said excavating apparatus further comprises a hollow body nonrotatably received in said connector opening,  
said connector pin is rotatably received in said hollow body, and  
said excavating apparatus further comprises cooperating structures  
10 associated with said hollow body and said connector pin and operative to preclude appreciable axial movement of said connector pin relative to said hollow body.

15        29. The excavating apparatus of Claim 25 wherein:  
said wear member has an interior side surface recess area through which said outwardly extending longitudinal portion of said connector pin may be forwardly moved into and rearwardly moved out of said wear member, said recess area having an abutment area that cooperates with said outwardly extending longitudinal portion of said connector pin, when  
20 said connector pin is in said first rotational position thereof, to block forward removal of said wear member from said projecting portion of said support structure.



30. The excavating apparatus of Claim 25 wherein:

said wear member has a locking portion rotatable with said outwardly extending longitudinal portion of said connector pin between locking and unlocking positions in which said locking portion respectively  
5 (1) defines an abutment surface, when said connector pin is in said first rotational position thereof, that captively retains said outwardly extending longitudinal portion of said connector pin within said wear member, and (2) releases said outwardly extending longitudinal portion of said connector pin when said connector pin is in said second rotational  
10 position thereof.

31. The excavating apparatus of Claim 25 wherein:

said wear member has an interior side surface projection thereon which, with said connector pin in said first rotational position thereof,  
15 defines an abutment cooperating with said outwardly extending longitudinal portion of said connector pin to prevent removal of said wear member from said projecting portion of said support structure and, said outwardly extending longitudinal portion of said connector pin being  
20 configured in a manner such that, with said connector pin in said second rotational position thereof, permits said interior side surface projection to be moved forwardly past said outwardly extending longitudinal portion of said connector pin.

32. The excavating apparatus of claim 1 wherein:

25 said support structure has a rear base portion with a front end surface from which said projecting portion forwardly extends, said front end surface having an alternately scalloped configuration.

33. The excavating apparatus of Claim 32 wherein:

said alternately scalloped configuration is defined by peripherally alternating forwardly and rearwardly curved portions of said front end surface of said rear base portion.

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34. The excavating apparatus of Claim 25 wherein:

said support structure has a rear base portion with a front end from which said projecting portion of said support structure extends, and

said front end of said rear base portion of said support structure and  
10 said rear end of said wear member are alternately scalloped in front-to-rear directions and are in a complementarily interlocked relationship.

35. The excavating apparatus of Claim 34 wherein:

said front end of said rear base portion of said support structure and  
15 said rear end of said wear member have peripherally alternating forwardly and rearwardly curved portions.